

MARINE REVIEW.

VOL. IX.

CLEVELAND, O., AND CHICAGO, ILL., MARCH 1, 1894.

No. 9.

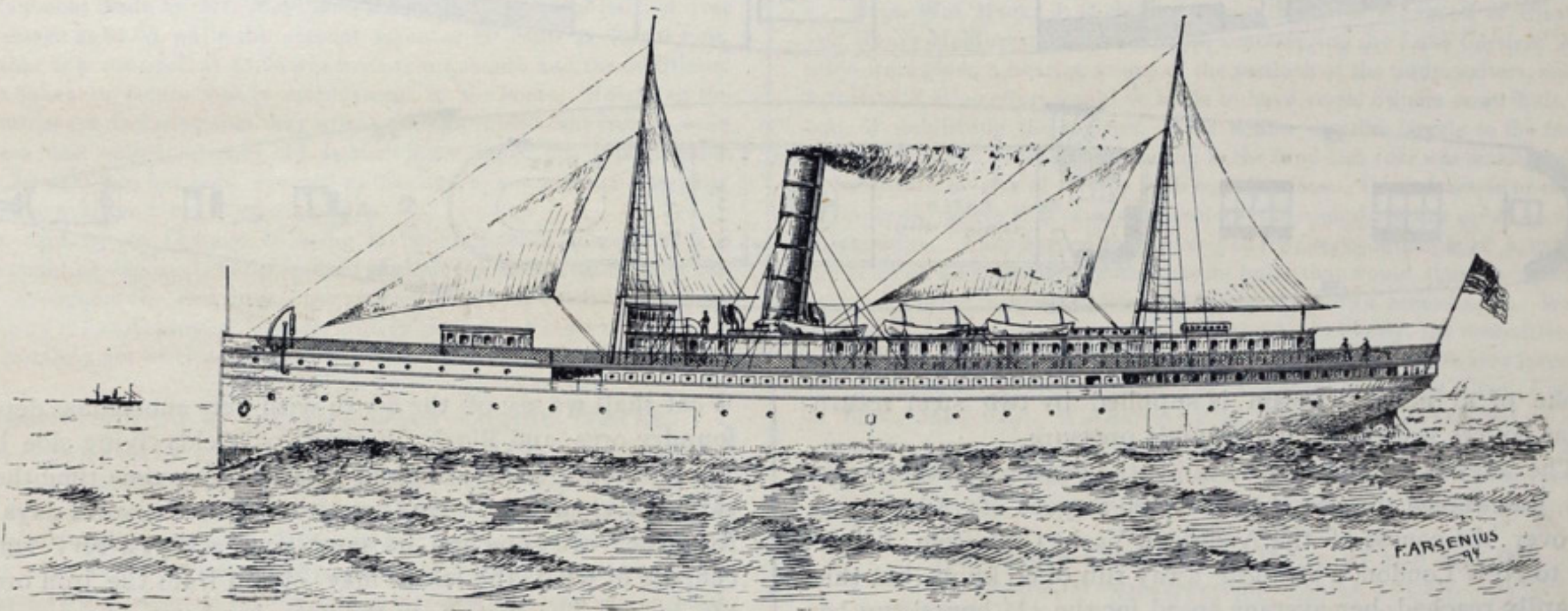
Old Dominion Steamers.

The accompanying illustration shows the object of the latest launch at the ship yard of the Delaware River Iron Ship Building and Engine Works, Chester, Pa. This steamer, named Yorktown, and a sister-ship, the Jamestown, were built for the Old Dominion Line, which runs a fleet of fine passenger ships between New York and Old Point Comfort and Richmond. The correct dimensions are: 322 feet over all, 300 feet keel, 40 feet beam and 26½ feet moulded depth. The engines are 28, 44½ and 73 inches by 54 inches, steam being furnished at 180 pounds by four boilers, 13 feet 10 inches diameter by 12½ feet long. Each boiler has three corrugated furnaces.

From the illustration it will be seen that the stack is unusually high. It measures 86 feet from the grate to the top and is elliptical 8½ feet by 6 feet 10 inches. The propeller is built up, four bladed, and is of manganese bronze cast by the Crown Smelting Company, Chester, Pa. The engine runs on babbit metal run into brass boxes. The circulating and air pumps are of the Blake pattern, and the steering gear is Sickles improved,

considering the question of premiums paid to contractors of war vessels for the navy. It had been claimed by opponents of the premium system that this could be done by Assistant Naval Constructor T. W. Hibbs, Capt. Lundborg of propeller fame and Superintending Constructor Lewis Nixon of the Cramp company.

Mr. Hibbs appeared before the committee at its request. He said that he was educated at Annapolis and afterwards at the Glasgow University, Scotland. He had had about two years' experience at ship designing, but did not consider himself an expert. When asked whether he thought that those who drew the designs for a ship, and the engineer who determined the engines to be used as well as the horse power, would know within a quarter of a knot what speed the vessel would make before she was built, he replied, "No, sir, I do not by any means." He had assisted in drawing designs for the construction of two gun boats. One was a vessel of ordinary construction and he had considerable data upon which to go on. He thought that he might predict within a knot of the speed of that vessel. The



OLD DOMINION PASSENGER AND FREIGHT STEAMER YORKTOWN.

manufactured by the Morgan Iron Works, New York, while the windlasses are the latest style Providence.

Both boats are schooner rigged, having pole masts with leg of mutton sails. There are three decks and a hurricane deck. The cabins are furnished in mahogany, and 100 first class and 150 second class passengers can be accommodated. Among other features is the length of forecastle, 86 feet, and the side ports are on a railway. Four elevators facilitate cargo handling. Between 200 and 300 lamps are lighted by an Edison installation. The speed of these ships will be between 15 and 16 knots. Mr. R. T. Dickinson is designing engineer and naval architect for the Delaware company.

Not Calculating Speeds Within a Quarter of a Knot.

Some interesting opinions on the question as to whether, with given designs and engine power, naval architects could calculate the speed of a vessel within a quarter of a knot were given before the committee on naval affairs of the House of Representatives, a short time ago, when that committee was

other had peculiar designs and he would not be willing to predict the speed within a knot and a half.

Commodore George W. Melville, engineer-in-chief of the United States navy, was asked whether from the designs of the New York and Columbia any competent naval architect could know that the ships would make a much higher speed than the contracts specified. His reply was "absolutely no." When asked whether the designers, knowing their lines and the construction of their engines, could foresee the speed of a vessel within a quarter of a knot, he replied "No, sir; nor within a half a knot. It was possible that they could do so within three-quarters of a knot."

Commodore Philip Hichborn, the chief constructor of the United States navy, was asked a similar question, and replied that he considered it impossible to predict within a quarter of a knot the speed in ships of a new design. At a lower rate of speed you could get it closer than at a higher rate, but in anything beyond twenty knots you want a margin of from half to a whole knot in vessels of a new type.



SUPPLEMENT TO MARINE REVIEW, CLEVELAND, O., MARCH 1, '94.

Nineteenth Annual Convention of the Marine Engineers Beneficial Association.

Held at Washington, D. C., January 22-28, 1894.

1 F. H. NEWBALL, "1." Buffalo, N. Y.	8 FRED D. COOK, P.N.T., "59." Boston, Mass.	15 J. GEORGE HERMES, "69." New York, N. Y.	22 GEORGE UHLER, N. P., "69." New York, N. Y.	28 N. K. LUDLOW, "84." Mobile, Ala.	34 J. J. HARRISON, "56." New York, N. Y.
2 F. P. FITZGERALD, "43." Port Huron, Mich.	9 JOHN HEGEMER, "48." Sandusky, O.	16 C. M. STODDARD, "2." Cleveland, O.	23 B. F. WARD, "50." New York, N. Y.	29 CHAS. A. REEDER, "5." Baltimore, Md.	35 WALTER BARR, "69." New York, N. Y.
3 JOHN N. KIRBY, "2." Cleveland, O.	10 JOS. THOMAS, "36." New Haven, Conn.	17 PHIL J. McEWEN, "68." Chicago, Ill.	24 FRANK A. JONES, "35." San Francisco, Cal.	30 MICHAEL CONLEY, "4." Chicago, Ill.	36 G. W. ROUSE, N. Chap'n, "56." New York, N. Y.
4 WM. T. WALKER, "3." Detroit, Mich.	11 THOS. F. DOWD, N. S., "4." Chicago, Ill.	18 DOTTIE DOWD, ——— Chicago, Ill.	25 CARRIE CONLEY, ——— Chicago, Ill.	31 NATHAN LAWRENCE, "74." New London, Conn.	37 OTTO BOETTGER, "32." Baltimore, Md.
5 JOS. BROOKS, "13." Philadelphia, Pa.	12 ANDREW MCGILLIVORY, "78." Duluth, Minn.	19 W. J. DuBois, "50." New York, N. Y.	26 JOHN A. WATTS, "93." Washington, D. C.	32 J. J. A. WILLIAMS, N.T., "15." New Orleans, La.	38 JOSEPH LANCE, N. Con., "1." Buffalo, N. Y.
6 E. D. LOCK, N. D. K., "37." Toledo, Ohio.	13 WALTER M. MILLER, "59." Boston, Mass.	20 LEWIS McALLISTER, "13." Philadelphia, Pa.	27 GEO. P. WILSON, P.N.P., "13." Philadelphia, Pa.	33 MICHAEL J. BURKE, "63." Albany, N. Y.	39 J. M. CRONENWORTH, "3." Detroit, Mich.
7 DAVID SHEKHAN, "81." Pensacola, Fla.	14 FREDK. NIXON, N. T., "35." San Francisco, Cal.	21 J. H. MITTENDORF, "5." Baltimore, Md.			

High-Powered Steam Yacht Columbia.

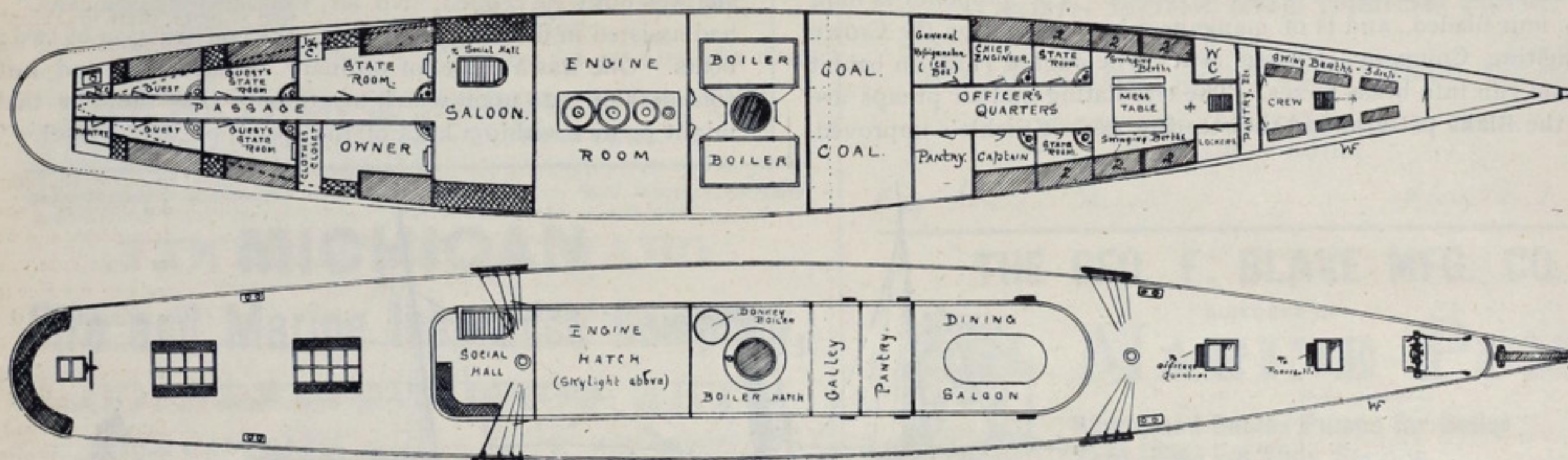
The handsome steel steam yacht Columbia, owned by Mr. J. Harvey Ladew of New York is, in proportion to her displacement, the highest powered private steam vessel in the world. The contract for her construction was awarded to the Wm. Cramp & Sons Ship and Engine Building Company of Philadelphia, Pa., who in turn sublet the hull to the Charles Hillman Co. of the same city. Her principal dimensions are: Length over all, 191 feet 6 inches; length, load water line, 180 feet; beam, 23 feet; depth of hold, 14 feet 3 inches; draught forward, 9 feet 9 inches; draught aft, 10 feet 9 inches; displacement, 436 tons.

All the appointments and fittings of this yacht are of the most modern and approved character, her interior arrangements being shown by the accompanying engraving. She is fitted with all modern appliances, including steam and hand steering gear, steam capstan and windlass, and a complete electric plant and telegraph and telephone communications throughout. Her propelling power consists of a four-cylinder vertical inverted direct acting triple expansion engine of about 1,800 horse power, a duplicate of the engines in the U. S. S. Vesuvius. The cylinders are 21 1/2, 31, 34 and 34 inches diameter, respectively, with

is more wonderful than any tale of Alladin's lamp. The bold, energetic, typical American stopped at nothing. He asked for iron and steel in calls so loud and urgent that at times, with all our energy and enterprise, we were unable to meet them, and the foreign producers came in to assist us when we could wait no longer. It is idle to speak of the results. We know them well. From the Lake Superior mining ranges came the material for the railroads, steel steamships, telegraph lines, plows and even the little wire nail.

But what of the land from whence all this wealth came? The government sold or gave it away and he who purchased gained a fortune unawares. The prospector who found the deposit and the capital which came afterwards to these mines paid the fee owner a price for the iron ore, which even then filled the pockets of all three, and stimulated by such success the whole iron formation became dotted thereby with shafts and holes looking for the box of gold at the bottom. Who can estimate the money expended in the last fifteen years to furnish our own country with iron and perhaps the western world with soft cheap steel? We would go no further if we could not now have it.

Unduly stimulated by large returns we find the Lake Superior mines can furnish far more than our whole country requires.



DECK PLANS OF HIGH-POWERED YACHT COLUMBIA.

a stroke of 20 inches. Steam is supplied by two steel return tubular boilers working at 160 pounds pressure.

The Messrs. Cramps, who built the engines in their own shops, guaranteed the vessel to develop a speed of 18 knots an hour over the course of the American Yacht Club from Larchmont to New London, a straight away run of 80 knots, but this she hardly reached, her average speed for the 4 1/2 hours' run being 17.85 knots with 235 revolutions per minute. For one hour, however, she steamed 18.35 knots or over 21 statute miles. W.F.

Iron Mining Royalties.

We are now entering upon a new order of things in the production and shipment of iron ore, and the question naturally arises, how is the fee owner affected by the conditions which confront him and from which there is no escape? Prior to 1878 the entire production of iron ore mined in the Lake Superior region was 10,426,842 tons, obtained almost entirely from the old Marquette range, while more than one-half of the entire quantity came from the Cleveland, Jackson and Lake Superior mines alone. The lands from which these great mining companies obtained their ores were purchased by the early pioneers at a small cost, and even they comprehended little to what vast proportions the enterprise which they inaugurated would be extended in two short decades. Incomprehensible as it may seem, nearly sixty-nine millions of tons have been produced since the first day of January, 1878. The demand for iron and steel in the United States of America is the crowning glory of this century. The history of what has been accomplished in twenty years

What shall we say of the south with her enormous deposits of foundry ores and Black Warrior coal fields lying side by side. We shall have cheap iron and steel and for some time the fittest can hardly survive. It is true enough the bonanza days of the fee owner are gone and he must now accept a very small percentage of what the lessee may obtain from the iron ore under his land. The system in the past has been all wrong. It required the payment of so much per ton, no matter what the quality might be, the operator assuming all the risk. In other words, the price for No. 1 hard Red River wheat was the same as that paid for grain grown in other places under the poorest conditions, dirty and musty besides. The ease with which the soft hematites, practically exhaustless, can now be produced in comparison with the hard ores is another factor which must be settled also. The whole subject at this point is full of suggestions, perhaps of argument, but when you have finished we shall have the following result: There must be a standard established both in iron and phosphorus (to be determined by the consumer) upon which the land owner receives his rent, and that man is wise who now goes to his tenant, the unfortunate miner, crippled by debt, or perhaps to-day insolvent, with his explorations or developments filled with water, and offers to take only what can be paid. This rate or percentage should be based upon the selling price at Cleveland, modified by such other conditions as surround each individual case.

"ANTONIO."

No change will be made in Canadian canal tolls for the coming season.

Important Sales of Ore.—Freight Contracts.

A large amount of ore, probably a million tons, had been sold up to Thursday of this week, and the sales agents of Cleveland were fast adjusting their business to the basis of \$2.75 a ton for standard Gogebic Bessemer, set by the Norrie sale of several days ago. The principal sales are of Norrie, represented by E. C. Pope, Aurora and Ashland, by Oglebay, Norton & Co., and Minnesota and Chandler, by Pickands, Mather & Co. The latter firm has also sold some Canton ore, to come from one of its Missabe range mines. The price of the Gogebics sold by Oglebay, Norton & Co. is very probably the same as that of the Norrie, while the Chandler figure is \$2.90 or \$2.95. The purchasers are the Carnegie Steel Company and other leading buyers, so that there is no doubt now of a speedy adjustment of prices, in accordance with these sales, between the various ore companies and their customers on the great bulk of business to be done in advance for the coming season. Probably the most significant sale is that of the Canton, one of the Minnesota mines on the Missabe, at \$2.25. There is no question about the price. It is a Bessemer ore, not as good as the leading Missabes, but the sale would indicate that the price of Biwabik, Mountain Iron and others may even drop below \$2.50. It was claimed that 100,000 tons of Franklin, one of the best Missabes, had been sold, but M. A. Hanna & Co., representing that mine, deny the report. Sales agents representing the best Missabes would have it understood that they will not sell on a basis of \$2.75 for the favorite Gogebics.

With readers of the REVIEW, who are acquainted with the iron business, it is not necessary to go into detail about the mines that will be entirely shut out by these extremely low prices, nor about the accompanying reductions that must prevail in costs connected with production and shipment, but these sales have brought out some facts about lake freight contracts. A large part of the ore will be carried by the boats of the companies making the sales, but the freight rate from the head of Lake Superior has been established by several contracts running to about October 1st at 80 cents. The big new steamer Harvey H. Brown, now nearing completion at Detroit, is engaged for 40,000 tons, and another block of a larger amount is covered by the boats of two or three Cleveland managers. The Drake-Maytham steamers of Buffalo, according to a statement made by Mr. Maytham, have only 21,000 tons carried over from last season at \$1.05, while the amount taken at 80 cents is 60,000 tons. He says that the contract at \$1.05 was for a trip a month and the additional block was taken to secure steady employment of the boats. Nearly all the leading owners are declaring that they will not accept the 80-cent freight, even for steamers best suited to carry ore at such a low figure, but it is probable that about 500,000 tons has been covered at that figure, and one ore company claims to have tonnage for the full season.

Grain capacity in Chicago is being taken at 2½ cents on corn about as rapidly as could be expected, but it is claimed that the mild weather that has prevailed throughout the west during the greater part of the winter will have some effect on the coal shipping business during the coming season. Stocks of coal will certainly not be cleaned up as they were at the opening of last season.

Superintendent of the Dry Dock Engine Works.

In the selection of Mr. C. B. Calder to take charge of the machinery department of its extensive Detroit plant, it is more than probable that the Detroit Dry Dock Company has made a very good move. For a number of years Mr. Calder has been known on the lakes as a leading engineer, who combined study with a practical knowledge of the operation of marine engines. In his new position he will be one of the few men connected with lake engine building works who can claim this advantage. In having a man capable of incorporating the practical ideas of a working engineer in the design and construction of engines, and then going aboard the ship to look after the details that so often cause differences with owners, the Detroit company will certainly be greatly benefited. Mr. Calder's friends believe him capable of doing this and have no fear of his success. Since he obtained a license as a marine engineer when a very young man, he has been steadily engaged on the lakes. His first work of importance ashore was done on some of the boats of the Owen line of Chicago, of which he was chief engineer for several years. In looking after the building of the steamers Owen and Foster, he was brought into close relations with the firm of M. A. Hanna & Co. of Cleveland and was made superintending engineer in the employ of that company when the management of nine steel steamers of the Mutual and Menominee lines was brought into its office. New methods which he introduced in the position attracted the attention of leading vessel owners in Cleveland, and the ability which they recognized in him will undoubtedly result to his advantage in the new position.

Engines of a Cleveland Fire Boat.

An illustration on page 9 of this issue represents the engines of a second fire boat for Cleveland harbor, for which Thomas Manning, Jr., & Co. are the contractors. The boat is of wood, 82 feet extreme length, 21 feet beam and 11 feet moulded depth, and is plated with quarter-inch steel for 20 inches above and 40 inches below the water line. In the construction of the hull and in the matter of equipment, which includes steam steering gear and other modern appliances, the boat has been very well planned. The engines are non-condensing, calculated to work with a steam pressure of 140 pounds per square inch.

The cylinders are 18 inches bore with a piston stroke of 20 inches. The valves are of the piston type working in bushings with bridged steam ports. Piston rods, valve stems and links are of steel, and the connecting rods, front columns and shafting are of the best hammered iron. The piston rods and valve stems are packed with metallic packing, and the engine is provided with steam reversing gear and "hooking up" arrangement. Steam will be supplied by two Almy water tube boilers. The propeller is of cast steel, 7½ feet diameter and 12 feet pitch.

The pumping capacity of this boat will be about 5,000 gallons per minute, as against 3,200 gallons credited to the Weatherley, the first boat built in Cleveland. There are two sets of double pumps with steam cylinders 16 inches diameter, water cylinders 9½ inches diameter and a stroke of 12 inches. Eight 3½-inch discharge nozzles are located under the pilot house forward and there are three on either side of the boat, about amidships. The bow nozzle will be on top of the pilot house, forward in the boat, and can be arranged to throw a 3, 3½ or 4-inch stream. The hull is expected to be ready for launching in a few days and the boat complete will be turned over to the city in May.

Inland Lloyd's Register—Vessel Valuations.

Special correspondence to the MARINE REVIEW.

DETROIT, MICH., March 1.—All of the general agents of insurance companies doing business on the lakes were represented at the meeting held here this week, and contrary to expectations sufficient harmony now prevails to admit of some revision in last year's valuations and ratings on lake vessels. A compromise was reached between the rival firms of Chicago and Buffalo by an agreement to remove the headquarters of the register to Cleveland, and Capt. Daniel McLeod, who was again elected chief inspector, with Capt. F. D. Herriman as an associate on questions regarding steel boats, will immediately engage offices in some one of the Cleveland buildings where the shipping interests are represented. It is expected to have the inspectors go to work immediately and examine all vessels regarding which there is any question relative to former ratings. Other officers of the register association are: C. W. Elphicke of Chicago, president; Henry Sill of Buffalo, vice-president, and C. A. MacDonald of Chicago, secretary and treasurer.

Capt. Wm. Mack, J. C. Gilchrist and Henry A. Hawgood of Cleveland, and Henry McMorran of Port Huron, representing the Lake Carriers' Association were given a hearing at one of the sessions of the underwriters, and were informed that no effort would be made to have vessel owners contribute to the cost of publishing the register. This action was due largely to the fact that the proportion of owners contributing to the fund last year was small, and there is, of course, no way of forcing such contributions. On the matter of most importance to owners, that of new valuations, the committee was given no definite information. They argued that if the underwriters contemplated a cut of 20 per cent. on all valuations, premiums on hulls that would thus be reduced to more expensive insurance classes should be cut down accordingly. While it was admitted that some vessels were valued too highly, the committee made the claim that a sweeping reduction would be disastrous to the very large number of vessels of medium valuation. A. A. Parker of Detroit, Capt. John Rice of Buffalo and Capt. William Mack of Cleveland were selected as a sub-committee to represent the vessel owners in matters that may come up during the progress of new work on the register. The extent of their power must, of course, be limited to whatever the underwriters see fit to grant to them.

Hay Lake Channel.—Affairs at the Sault.

Special Correspondence to the MARINE REVIEW.

SAULT, STE. MARIE, Mich., March 1.—It is thought that the new channel through Hay lake will be open for navigation about July 1, and if dredging on the sections of the 20-foot channel in this vicinity—at Little Mud lake and the encampment—progresses as expected that work will be completed by the close of next season. There is some question as to the distance to be saved by the new Hay lake route. Here is a calculation made from the charts, which places the saving at ten miles:

	Miles.
Detour Light to Anthony's dock.....	2½
Anthony's dock to Lime island dock.....	9
Lime island dock to can buoy, Mud lake.....	10
Can buoy to Johnson's point, Rains' island.....	4
Johnson's point to intersection Hay lake channel.....	4½
Intersection of channel to Rains' dock, Sugar island.....	1½
Rains' dock to head of cut, Lake George.....	7
Head of cut (or flats) to Church's point.....	6
Church's point to intersection of Hay lake channel.....	11
Intersection of channel to lower lock gates.....	2
Lower lock gates to abreast Point Iroquois.....	15
Total.....	72½

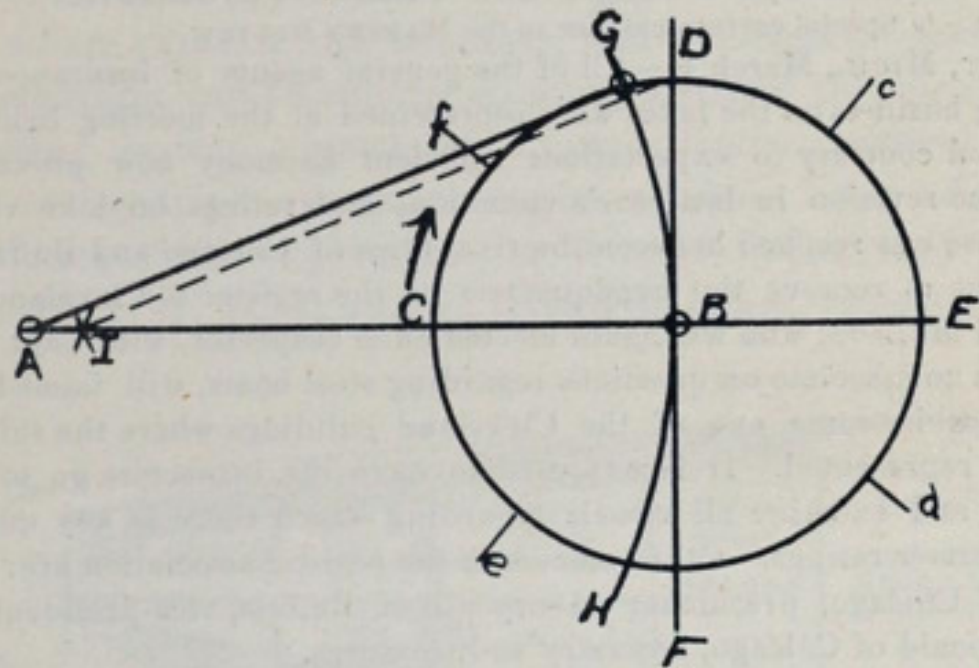
From the point where the Hay lake channel leaves the old channel to where it joins it again is 15½ miles, while by the old channel the distance is 25½ miles.

The new survey of St. Mary's river under the charge of Lieut. C. S. Riche, corps of engineers, U. S. A., is progressing very well. One chart is about completed and the others are well advanced. If a sufficient appropriation can be secured from congress for the immediate completion of the survey, it can be completed in two more seasons. It will be a most complete survey extending from Whitefish point to Detour and embracing all the land marks.

Concerning the Slide Valve.

BY GEO. C. SHEPARD, CLEVELAND, O.

To the valves controlling the steam and exhaust of an engine may be ascribed in a very great measure the performance of that engine, and while newer and more complex forms have some decided advantages, the oldest and simplest, the common slide valve actuated through a Stephenson link, is still the popular one on the lakes. Its duties are manifold, since it has to open to and close to the steam and open to and close to the exhaust at both ends of the cylinder, eight actions in all in each complete stroke, each to be performed at the right time relative to the stroke of the piston by this single valve moving up and down, and when for the purpose of effecting an earlier cut-off the links are moved up, the points at which each of these eight actions occur are changed both relative to the stroke of the piston and to each other. The problem of anticipating the results of these actions in the different positions of the link, or even at full gear, is like trying to see through a brick—a graphical system of investigation is a hole in the brick. Perhaps the most confusing element in the results of the valve's action is due to the irregularity of the velocity of the piston caused by the connecting rod.



In the above figure the point A represents the center of the crosshead pin, B the center of the shaft, the full circle the path of the crank pin, and the distance from A to B the length of the connecting rod. By describing the arc G H I with a center A and a radius equal to A B, it becomes evident that the points at the intersection of the arc with the crank pin circle are the points at which the crank pin will stand when the piston is in the middle of its stroke, and it follows that when the crank has completed its full quarter revolution from C to D the piston will have traveled more than half its stroke by the distance from A to F. For each of the second and third quarter revolutions of the crank, the piston will travel less than half its stroke, while in the fourth quarter the piston again moves through more than half its stroke. Hence, the velocity of the crank being uniform that of the piston is not uniform, and with the crank traveling in either direction the piston will travel relatively the fastest during each of the half strokes performed between the end of the cylinder remote from the crank and the middle of the cylinder.

Neglecting the effect of the eccentric rod on the motion of the valve—that is, assuming the motion of the valve to be uniform and starting from C in the direction indicated by the arrow—we find that because the speed of the piston during the first quarter revolution from C to D is excessive, the opening to steam permitted by the valve during that quarter of revolution is less in proportion to the piston movement than it should be, and continuing the revolution we find that the valve closes to the steam when the piston is further from the beginning of the stroke than it does on the return stroke from E to C. Also on the return stroke with crank traveling from E to D the piston is traveling below average speed and the port opening for the supply of steam being allowed as uniform for each stroke, the supply of steam will be greater in proportion to the piston movement.

On the exhaust side of the valve the effect will be seen to be more opening of exhaust, while the crank is moving from E to C with a later opening and earlier closure on the same stroke. This effect of the connecting rod becomes less as its proportion to the length of stroke becomes greater.

The action of the eccentric motion converted into a reciprocating one makes the latter irregular in the same proportion and for the same reasons as explained above with reference to crank and piston. Referring to the figure let B c represent position of eccentric with crank at C ready to commence the first quarter revolution from A to C. As it does this the eccentric moves to d, and it is seen that while the connecting rod causes the piston to move at its quickest speed the position of the eccentric is such that it will cause its rod to diminish the valve travel through the greater part of the eccentric quarter revolution, and tracing these results through the four quarters of a crank revolution we find:

First quarter—Rapid piston; slow valve.

Second quarter—Slow piston; slightly slow valve.

Third quarter—Slow piston; rapid valve.

Fourth quarter—Rapid piston; slightly rapid valve.

From this it is seen that the effect of the eccentric rod is to aggravate the distortion caused by the connecting rod. The proportion of the distortion

caused by the eccentric rod to that due to the connecting rod will be as the throw of the eccentric is to the length of the crank. In an engine having a piston stroke of 42 inches with connecting rod 8 feet long, the distance A I from the center of piston stroke to center of crank revolution is $2\frac{1}{2}$ inches, and with a valve of the same dimensions at both ends this allows, with a certain lap, the steam to follow the piston 4 inches further on top than on the bottom, while there is a difference of one inch in the opening and closing of exhaust at top and bottom.

In a properly designed valve these distortions are taken care of and the valve is so constructed and set that the steam and exhaust lines of the valve perform their functions at equal distances from both top and bottom. The steam closure is "squared" by adding lap to the top end and increasing the lead at the bottom. The effect of increasing the steam lap is to cut off the steam earlier in the stroke, but it lessens the port opening and produces possible wire drawing if travel is short or port narrow, so that while the steam may be cut off a trifle longer on top its effect is apt to be balanced by the loss in this wire drawing and the laziness of the steam opening till the mean effective pressures on the two sides are equal.

The squaring of the exhaust, also highly important, is accomplished by making the inside lap on top less than that at the bottom, and as generally the case in triple expansion engines with short steam lap and valve travel, negative inside lap is used to keep down the compression on the first and second cylinders, the negative lap on top is greater than at the bottom. The effect of a valve may be partly squared by raising it on its spindle and then adding steam lap at top and exhaust lap at bottom to finish. Since both ends of the valve are actuated by the same eccentric with a definite angularity, it follows that unless the valve is raised on its spindle the sums of the lap and lead at each end are equal to each other and to the angularity of the eccentric, so that if the difference in the laps at the two ends is more than the lead at the bottom the lead at the top will be negative, and unless the compression will raise the steam in the clearance spaces to the initial pressure this is to be avoided.

A considerable inside lap either positive or negative is necessary to effect much change in the points of opening and closing the exhaust, because at that time the eccentric is near the quarter revolution and the valve is moving rapidly, but a small negative lap makes considerable difference in the amount of opening to the exhaust at the end of the stroke and when it is most needed.

When an engine is fitted with a Stephenson link, as most of our lake engines are, and the link is pulled up by any means to get an earlier cut-off and more expansions the valve spindle works from a point between the points of full gear ahead and full gear backing and the motion it receives is one due to the combined motions of the go-ahead and backing eccentrics, and this motion is resolved into that which would be imparted by a single eccentric having a different throw and angularity from the eccentrics used. The further the valve spindle is from the go-ahead position the less becomes the throw and the greater the angularity of this "equivalent eccentric." This means a quicker cut-off of the steam, a less steam port opening, less exhaust port opening and a later opening and quicker closing of the same. The greater angularity means increased lead, but what is worse an early closing of the exhaust produces a larger compression. "Hooking up" produces also an inequality in the relative occurrence of events at the two ends of the cylinder.

There is, however, a method which enables us in a great measure to get over this difficulty of an increasing lead, but only for one motion, and that at the expense of the reverse motion; that is, if we equalize the lead for the forward motion we make the distribution of the steam so much more imperfect when the engine is running backward. In marine engines, which are only occasionally reversed, and that for short periods, this defect in the backward motion is of little consequence, and we can afford to improve the valve gear for the forward motion. Equalizing the lead by this method, we also alter it, and at the same time cause the cut-off to take place at a different position of the crank; this alteration of the lead will have to be compensated by changing the lap, and this again would vary the amount of port opening and still further affect the position at which cut-off takes place, so that in equalizing the lead all these have to be taken into consideration in designing the valve.

It is possible to design a slide valve actuated through a Stephenson link that will give good results while working in any one position, but the range for good working is small, and it is impossible to make a valve give good results working in all positions of the link; and if it is known at what point it is desirable to cut off the steam in the cylinder for the ordinary service of the engine the valves can be so constructed that they will cut off at that point and give good results by sacrificing good results in other points of cut off.

Plans are being prepared at the Sault for a new canal office, which will be built as soon as an appropriation can be had. It will be an elegant building, situated between the two locks at the east end.

SOME TIME AGO THE MARINE REVIEW PUBLISHED A SHORT HISTORY OF LAKE NAVIGATION, RUNNING THROUGH FIVE NUMBERS. WE HAVE SEVERAL SETS OF COPIES OF THESE NUMBERS WHICH WE WILL FURNISH AT 50 CENTS. ONE OF THE NUMBERS CONTAINS INFORMATION OF LOCKS OF THE ST. LAWRENCE AND ERIE CANALS, WHICH IS WORTH THE PRICE ASKED FOR ALL OF THE NUMBERS.

Another Chapter on Whalebacks.

EDITOR MARINE REVIEW: With your permission I would like to help Mr. Dyer gather a few more facts from the so-called *ex-parte* statement on whalebacks and their inventor made by me, some time ago, in your journal, and perhaps assist him in the noble work of keeping the public mind from being misled in these matters. I might begin by giving my pedigree. Having had a practical training in science of ship building extending over a period of twenty-five years, beginning and continuing to work fully two-thirds of this time in some of the leading yards on the banks of the river most famous for ship building, and since then having traveled considerable, holding several important situations in large ship building concerns, and last but not least, having closely studied the rise and progress of whalebacks, I flatter myself that I have a right to be heard on this subject. I am not a scoffer at the practicability of whalebacks and never was, although I do claim kinship with naval experts. Nor did I join with those who predicted that the 101 would "turn turtle" when she was launched; on the contrary, I always regarded her and her progeny as exceptionally stiff vessels—that is, having abundance of statical stability. And further, I am of the opinion that those who ascribe such nonsensical utterances to naval experts and lay claim to discoveries in this direction by the invention of whalebacks only establish the fact of their own want of knowledge on the subject. The laws that govern floating bodies were known and clearly defined long before whalebacks were dreamt of.

My contention in the articles referred to by Mr. Dyer was not by any means what he gathered from them, and how he came to get what he says he did out of them, I fail to see. He might have quoted some of the "direct assertions" he alludes to that impugned the sincerity of Capt. McDougall's motives. He says: "So far as I can gather 'Fairplay' asserts that Capt. McDougall was not the inventor of the whaleback vessels." I emphatically deny this, and your issue of Dec. 7 last will bear me out, as in the communication in that issue, as well as in the first article referred to, there is reproduced the cuts of the sketch used in connection with one of his first patents (if not the first), along with part of the specification. This was put in, together with some historical facts regarding the character and conduct of the first vessel, the 101, to show that the claims were not realized in that vessel's performances, although she was a fac-simile of plans and drawings prepared from his own dictation, save improvements made during the process of her construction, which were an absolute necessity in order to prevent her falling to pieces before she was launched and to make her good for anything afterwards.

In short, Mr. Dyer has gathered just the opposite to the very heart and core of my contention in the articles referred to, which contention was that Capt. McDougall did patent his own ideas of a boat about the years 1880 to 1882, but when he began to build to them, even after eight years more of study and experimenting, he utterly failed to realize his claims, and simply proved to him-

self and every one else interested and competent to judge that it would be necessary to modify his ideas and take a leaf out of the book of the experience of others, which, some one has said, is an open book. However, I don't think it is the right kind of thing to go to the patent office with. Mr. Dyer if given to a great deal of exaggeration in the comparison he makes between some original genius suggesting and developing a watch, supposing such a thing had not previously been heard of, and the completed structure of a whaleback vessel, even were we to take for truth his assertions regarding the superior structural strength of the whaleback. To make the analogy about right, if we suppose, on the one hand, that we know nothing of watches before the imaginary genius

goes to work, we ought to take it for granted, on the other hand, that neither Capt. McDougall nor his assistants knew anything of the ordinary vessel previous to their beginning on whalebacks. This, I believe, might be applied fairly well so far as Capt. McDougall himself is concerned, but it would be entirely wrong in regard to his assistants, as there is no gainsaying the fact that the improved design and successful construction of the whalebacks is solely due to their ability, and to the application of the experience and extensive practice which they had in the construction of other vessels. Furthermore, it is well known, since the publication of the patents, that most of the details of construction claimed to be new inventions in whalebacks are identically the same in every respect as they are in other vessels and as they have been for upwards of thirty years.

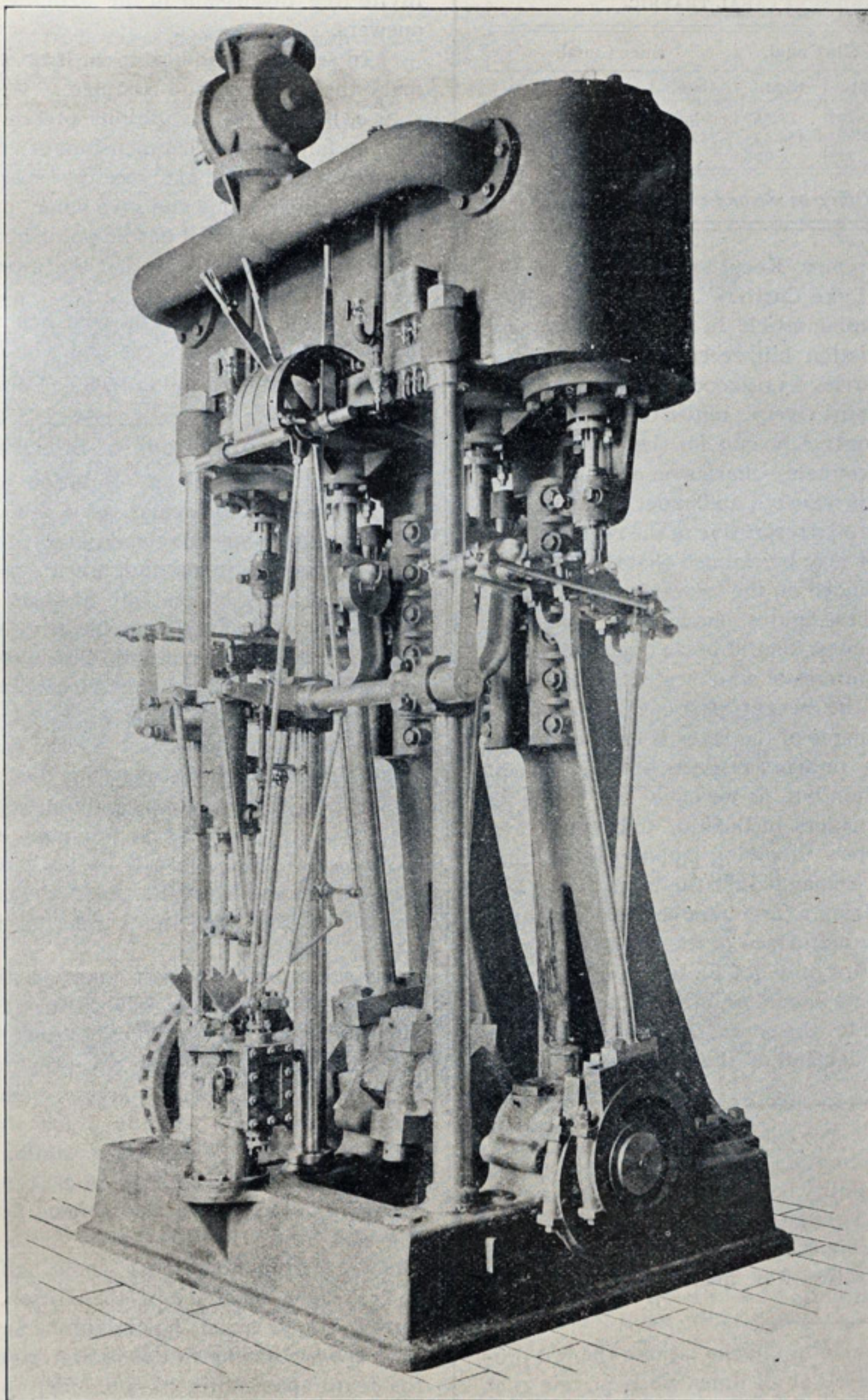
This naturally brings us to the conclusion of my last communication, namely, "on what principles are such claims for patents granted?" I might reply to this myself for the good of the public mind, "that it may not be misled in these matters." Being somewhat interested in patents on details of ship construction, I have carefully perused the files of the patent office containing such data, and find that some of the patents here referred to have been granted, after being repeatedly rejected, for apparently no other reason than simply the importunity of the solicitor. It appears that if he is well backed up by the financial ability of his client and encouraged to make persistent applications, in the absence of the infringement of patents previously granted, he will succeed, even independent of any real value in

the invention, either in point of ingenuity, originality or usefulness.

In conclusion I beg to say that we regret just as much as Mr. Dyer, or any one else, that the foregoing facts in this and the other articles in question are so. But having no power to change them, all we can do is to try and keep the public mind straight. You know "truth is often stranger than fiction," and frequently very harsh too, but "right wrongs no one." "Give the devil his due" and let us have the jewel.

FAIRPLAY.

There is some hope of a reduction in charges for unloading iron ore. The Lake Carriers' committee, appointed to look after this matter, will make a report to the managers of the association in Cleveland on Tuesday next.



ENGINES OF A NEW FIRE BOAT FOR CLEVELAND HARBOR.—SEE PAGE 11.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O.
Chicago office, (branch), No. 726 Phoenix building.

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ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1892.	1891.	1890.	1892.	1891.	1890.
No. vessel passages	12,580	10,191	10,557	3,559	4,207	3,389
Ton'ge, net regist'd	10,647,203	8,400,685	8,454,435	7,712,028	8,698,777	6,890,014
Days of navigation..	223	225	228	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

THE ATTENTION of Secretary Keep and members of the legislative committee of the Lake Carriers' Association in Buffalo is respectfully directed to an article in this issue showing that the Sundry civil appropriation bill, recently reported to the House of Representatives, carries \$5,040,000 for improvements on the Mississippi and Missouri rivers, under the continuous contract system, as against only \$450,000 for the lakes. The southern ports of Mobile, Savannah, Charleston and Galveston get \$2,315,000 additional in this same bill and under the same system of appropriations. This is all irrespective of the regular river and harbor appropriations. It may be claimed that the lakes get all that can profitably be expended on the works entitled to appropriations in the bill, but these figures, showing the vast sums of money going to southern states, should be an object lesson to the representatives of lake interests who are altogether too modest in their requests for the meager part of the appropriations to which the great commerce of the lakes is entitled for its advancement. Mr. Keep has in many respects proven himself an able officer in the association but as we have said before he is too willing, with other managers in Buffalo, to concede and give way in legislative matters involving appropriations that should not only be asked but demanded for the lakes. The last congress passed a bill authorizing a large number of aids to navigation on the lakes. Only a half-dozen of these, involving an expenditure of about \$80,000 are provided for in the civil sundry bill, although every one of them should be included to compensate for the millions granted to the south, and the legislative committee can in all justice demand of the senate that this be done.

* KINGSTON'S city council has again granted the Montreal Transportation Company exemption from taxes for ten years and its action will in all probability be sanctioned by parliament. What a howl would go up in Detroit, Cleveland and other cities on this side, where tax gatherers are continually worrying about vessel taxes, if such a proposition was made to the municipal authorities.

MR. BRICE of Ohio has taken up in the senate the bill providing for reports from all vessels at all times when arriving at or clearing from lake ports, so as to admit of the collection of statistics of the entire volume of commerce each season. If objection is again made to this measure by companies operating passenger lines, they should be made to prepare a fitting substitute for the proposed law.

ON the 16th inst. candidates for the position of cadet in the United States revenue cutter service will be examined at Washington and San Francisco. There are six vacancies. Rules of the service and instructions as to the method of procedure in entering it will be found in the REVIEW of Nov. 9, 1893.

Important to Engineers.

Realizing the growing desire among marine engineers to become better acquainted with the technical side of their vocation and with the practice of others, the REVIEW proposes to make a trial of increasing the amount of space devoted to their edification. We will have in each issue a special article on some subject of this nature, and we ask additionally the co-operation of the engineers in the way of questions which we will endeavor to answer and then publish with the answers. We also invite free discussion of the articles and of the questions and answers.

In sending in indicator cards or other data for investigation make the same full and complete. With indicator cards, for instance, besides the revolutions, pressures and number of springs, send so far as possible dimensions of valves, sequence of rotation of cranks, clearance and receiver spaces. Correspondents will sign their own name and give name of boat concerned to get answer, but these will not be published if it is so desired. The questions should be such that the answers will be of general interest.

Mr. Geo. C. Shepard, who has made numerous tests of marine engines and boilers, and who has had experience in designing and constructing same, will be associated with us in this department.

Appropriations of Interest on the Lakes.

The sundry civil appropriation bill, which was reported to the House of Representatives a few days ago, and which provides for miscellaneous expenses of the government, contains a large number of items that are of special interest to the lakes. A printed copy of the bill has been received. This measure, which covers the fiscal year beginning with July 1 next, provides funds for aids to navigation, light-house tenders, revenue marine expenses and such river and harbor improvements as St. Mary's Falls canal lock and other works covered by acts providing for continuous appropriations. As the house committee on appropriations has cut the estimate for this bill about 16 per cent., and as the total appropriations amount to but \$32,306,382.80, against \$41,716,311.15 in the last previous bill, it is not probable that any material reduction will be made when the measure is taken up by the house, so that there is reasonable certainty of securing all of the lake items referred to in the paragraphs that follow.

Aside from the regular appropriations for salaries, supplies, etc. in the light-house establishment, \$83,300 is recommended for new lights on the lakes, against \$198,300 for other parts of the country. The items covering proposed new aids on the lakes are: For moving Grassy point range lights, Maumee river, \$2,000; for beginning a fog signal at Seul Choix point, Lake Michigan, \$3,200; light station on or near South Bass island, Lake Erie, \$8,600; fog signal, Pere Marquette light station, Ludington, Lake Michigan, \$5,500; light and fog signal, Big Bay point, Lake Superior, \$25,000; light and fog signal, vicinity of Hammond's bay, about half way between Cheboygan and Presque'ile lights, Lake Huron, \$25,000; light and fog signal, Round island, Lake Huron, \$15,000.

Appropriations in the bill for river and harbor work under the continuous contract system foot up \$8,300,000, of which the lakes receive only \$450,000—\$300,000 for the St. Mary's Falls canal lock and \$150,000 for the Hay lake improvement. The Mississippi river commission gets \$2,665,000 for improvements below the Ohio river, in addition to \$1,625,000 to be expended on the same river above the Ohio, while the Missouri river commission is allowed \$750,000.

IF YOU WISH A COPY OF THE SUPPLEMENT CONTAINED IN THIS ISSUE, PRINTED ON HEAVY CARD-BOARD, SUITABLE FOR ASSOCIATION HALLS OR ENGINE ROOMS, SEND 50 CENTS TO THE MARINE REVIEW, CLEVELAND, O. COPIES OF THE SUPPLEMENT WILL BE SENT TO ANY MARINE ENGINEER SENDING A 2-CENT STAMP.

Around the Lakes.

Capt. J. J. H. Brown of Buffalo is in California.

Capt. E. M. Peck of Detroit is sojourning in Florida.

Capt. Ira Harris, auditor of the American Steel Barge Company, has resigned his position, to take effect on May 1.

The red fixed light on Pilot island is to be changed next spring to a fixed white with a red flash of a short duration.

B. B. Inman of Duluth has purchased the small side-wheel steamer E. T. Carrington and will use her for towing logs in shallow waters.

Light-House Inspector Green gives notice that the exhibition of lights on Lake Erie will be resumed March 15 and on Lake Ontario April 1.

Members of the Shipmasters' Association will try to have the Whitefish point (Lake Superior) light, which is a very poor red flash light, changed to the same order of light as that on Spectacle reef.

About ten big steel steamers have so far been chartered for package freight next season by the line companies. The engagement of the John W. Moore and Arthur Orr by the Lackawanna company is the latest announcement.

Capt. Alex. St. Bernard who died at St. Clair, Mich., a few days ago, was a sailor in the lake brig Marshal Ney away back in 1830. He piloted the man-of-war Michigan out of Erie harbor after she was launched in 1848. He was in his eighty-sixth year at the time of his death.

F. W. Wheeler & Co., West Bay City, have begun work on a triple expansion engine for Isaac Bearinger's steam yacht Wapiti. The cylinders are 9, 14 and 23 inches with 14 inches stroke of piston. The steam pressure will be 200 pounds and it is expected to attain a maximum of 400 revolutions in the engines.

Electric hoisting apparatus is being placed in one of the sterners of the Northern Line, the North Star, at Buffalo, by the Fisher Electric Company of Detroit. There is every prospect of success in the use of electricity for this purpose, and several other package freight steamers will undoubtedly be similarly equipped as soon as a trial is made with the apparatus on the North Star.

F. W. Wheeler & Co.'s negotiations in the east for new work are undoubtedly with the owners of the steamers Mackinaw and Keweenaw, which were built at West Bay City by the Wheeler company, and which are now profitably employed on the Pacific coast. It is announced that the owners of these ships are very well pleased with them and are in the market to contract for at least two more steamers.

The Bissell dock and warehouse, between First and Second streets, Detroit, has been leased for a term of years by the Northern Steamship Company and will be used by the new passenger boats building in Cleveland. Isaac M. Bortle, who was at one time city ticket agent of the West Shore road in Buffalo and later traveling passenger agent of the Missouri, Kansas & Texas, has been appointed chief clerk in the passenger department of the Northern company at Buffalo.

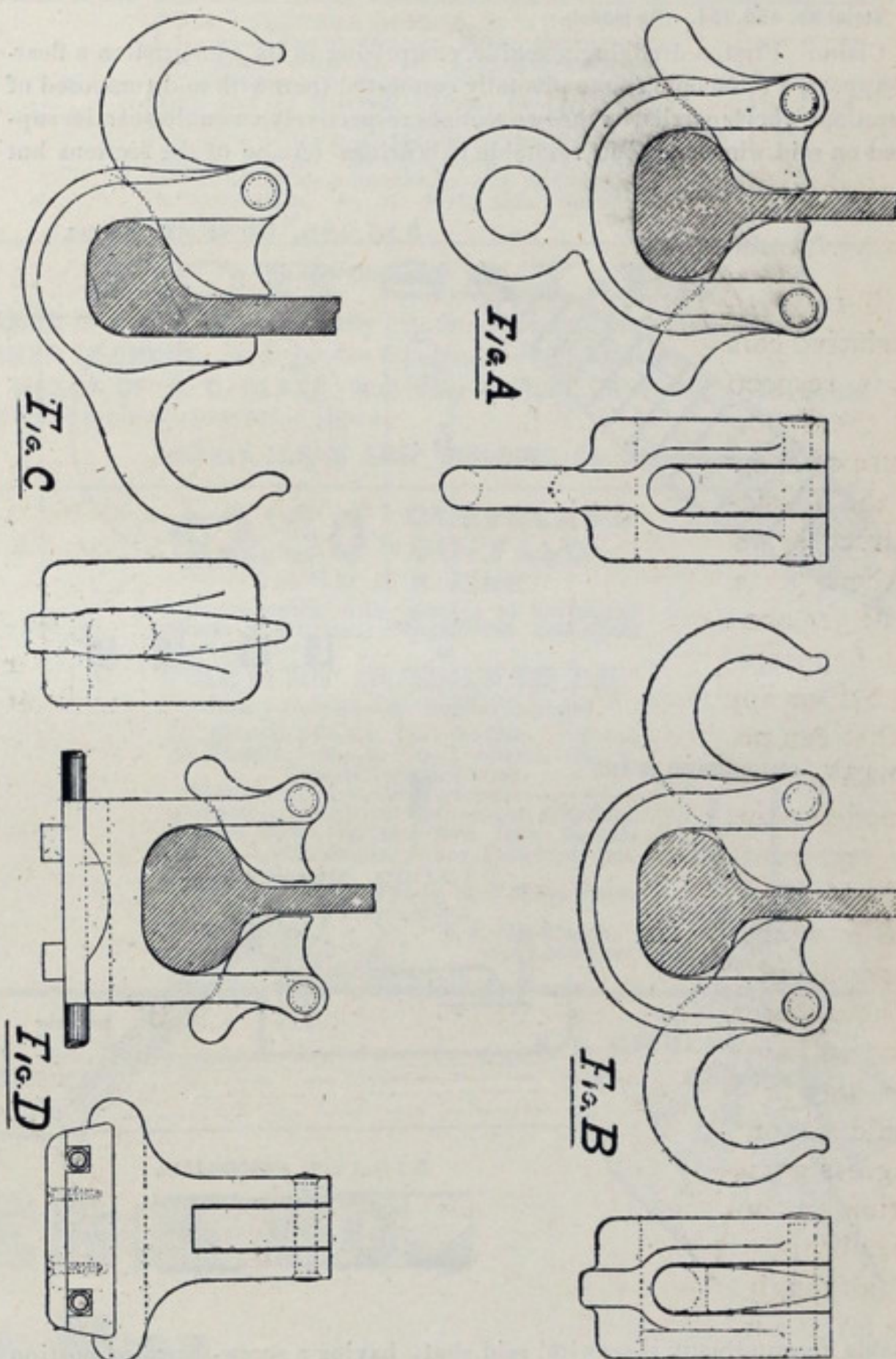
Capt. James Stone of Cleveland, who left the employ of M. A. Bradley several days ago, has been trying to secure stock subscriptions enough to begin the construction at the yard of the Cleveland Ship Building Company of a large steel freight boat with gangways and package freight handling appliances. The ship building company will take an interest in the boat if she is built, and Capt. Stone is of the opinion that the great reduction in the cost of building a first class steel boat is an item of sufficient importance to warrant the investment at this time, notwithstanding the unfavorable conditions that prevail in the carrying business. Steamers that cost \$200,000 in Cleveland a year ago can be built at present for \$150,000.

AN EXCELLENT LIBRARY FOR A MARINE ENGINEER, CHEAP—KEY TO ENGINEERING; WHAT AN ENGINEER SHOULD KNOW ABOUT ELECTRICITY; ENGINEERS' CATECHISM. ANY ONE OF THESE ARE WORTH A DOLLAR, BUT ALL THREE CAN BE HAD FOR \$1. SEND TO THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O. MONEY REFUNDED IF NOT SATISFACTORY.

Appropriations for two revenue cutters, one of them for the lakes, will be provided by the present congress.

McRee Improved Beam Clamp.

This is a patented device to which Williamson Bros. of Philadelphia are directing attention. In the usual form beam clamp security is obtained by the use of bolts which require time and labor in attaching them, and which, when in place, leave an ugly projection of several inches below the beam. In the between-deck parts of vessels this is, of course, objectionable on account of the limited head room. The improved clamp consists of a U shaped jaw with suitable eccentrics, arranged to clamp any structural shape of the bulb or I form for supporting weights, etc. No wrench is required, the clamp being merely



pushed onto the bottom of the beam or girder, the eccentrics automatically falling into place as soon as the jaw is properly seated. To remove, it is only necessary to raise the eccentrics, when it can at once be detached.

Fig. A shows the clamp attached to the bulb of a T bulb beam, and fitted with an eye for attaching hoisting gear or for other purposes. This form is useful for whipping up stores, leads, etc., on ship-board between decks. Figs. B and C show the jaw fitted with hooks for slinging cots or hammocks, where a permanent hook either was not provided, or, if so, would be unsightly and objectionable. Fig. D shows a hanger for temporary wires, pipes, etc., the bottom of jaw being fitted to receive a short piece of electric wire molding or other fastening. In the construction of vessels, buildings, etc., using metal beams, the temporary fixtures for running wires, etc., during the progress of the work, require moving, usually necessitating the cutting off of the light service even for slight changes. By the use of this hanger the wires can be easily and quickly moved to one side without interrupting the electrical or other service. All forms of this clamp admit of application to several sizes of beams of one form, (if variations are not very great) not requiring one for each size of beam in the ship or building. Clamps can be supplied in malleable iron, cast steel or brass, or finished as required. Among naval vessels on which these clamps have been used are the New York, Columbia, Minneapolis, Montgomery, Detroit, Marblehead and Bancroft.

Illustrated Patent Record.

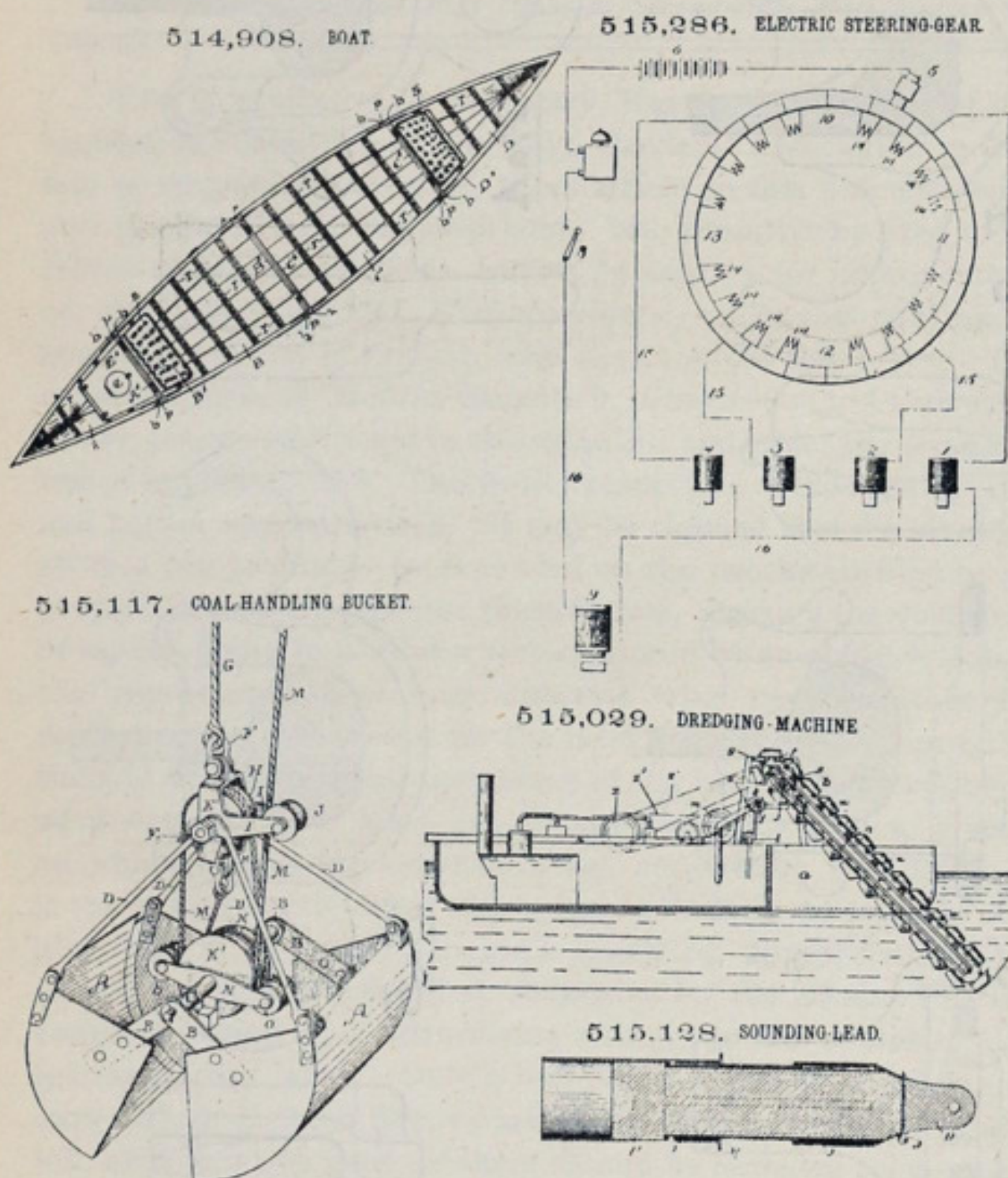
SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM
LATEST PATENT OFFICE REPORTS.

514,908. BOAT. Josiah L. Burton, Martinsville, Ind. Filed May 19, 1893. Serial No. 474,730. (No model).

Claim: The combination, in a metallic sportsman's boat, of several sections united together to form a boat as specified, one of said sections being provided with a water tight compartment in the bottom of which are tubes or pipes communicating with the water underneath the boat, said tubes or pipes being provided with plugs or caps whereby they may be closed when desired, said compartment being provided with a cover, and a cage being placed within said compartment,

515,029. DREDGING MACHINE. George H. Titcomb, Boston, Mass. Filed Jan. 14, 1893. Serial No. 458,334. (No model).

Claim: First, a dredging machine, comprising in its construction a floating support, a telescopic frame pivotally connected therewith and composed of two sections, wheels carried by the two sections respectively, an endless carrier supported on said wheels, a shaft rotatable in bearings on one of the sections but



movable longitudinally therewith, said shaft having a screw-threaded portion engaging a fixed nut carried by the other section, a worm-gear fixed on the shaft, and a worm engaging said gear and supported in bearings on the section of the telescopic frame in which the plain portion of the screw-shaft rotates. Second, in a dredging machine, the combination of a pivoted frame having upwardly projecting pulleys *uu* at its upper side, and downwardly projecting pulleys *vv* at its lower side, the series of endless wire ropes supported by said pulleys, the pulleys *vv* being arranged to support the outer ropes of the series at the lower side of the frame, while the pulleys *uu* arranged to support the intermediate ropes at the upper side of the frame, the transverse rods clamped to said ropes and the buckets secured to said rods and ropes.

515,117. COAL HANDLING BUCKET. William G. Curtis and John D. Isaacs, San Francisco, Cal. Filed Aug. 30, 1894. Serial No. 484,397. (No model).

Claim: In a hoisting bucket, the segments having their inner angles connected and swiveling about a central shaft, converging rods loosely connected with the outer angles and united by a pin at their meeting ends, a swivel shackle and hoisting chain connected with said pin, loose pulleys turning independently upon the shaft by which the inner angles of the bucket sections are connected, a hoisting rope connected with the yoke of the upper pulley, passing thence around the pulleys *K*, *H* and *K'*, and guard pulleys *O* journaled with relation to the shaft pulleys so as to retain the pulley rope or chain in position thereon.

515,128. SOUNDING LEAD. Peter T. Peterson, Brooklyn, N. Y. Filed Nov. 19, 1892. Serial No. 452,504. (No model).

Claim: First, the combination of a sounding-lead with a sliding sleeve *b* surrounding the same and adapted to be projected beyond its base, substantially as specified; second, the combination of a sounding-lead *a* having a

flange *d* with a cylindrical sleeve *b* having the shoulder and flange *h* and the flange *i* and the sleeve or cap *c* with the pin *e* substantially as specified.

515,286. ELECTRIC STEERING GEAR. Frank L. Dyer, Washington, D.C., assignor of two-thirds to Leonard H. Dyer, same place, and Alexander McDougall, Duluth, Minn. Filed April 17, 1893. Serial No. 470,613. (No model).

Claim: First, in an electric steering gear, the combination with a steam steering engine connected with the rudder, and an electric motor, for controlling said engine; of a circuit changer in the bow of the vessel, consisting of segments, a shaft *l'*, mounted centrally within said segments, a sleeve *g*, on said shaft, a contact arm *r* pivoted on said sleeve, a crank for actuating said shaft, a spring *t* on the end of said contact arm, and a ring *n* having notches *t2* with which said spring engages, substantially as set forth. Second, in an electric steering gear, the combination with a steam steering engine, connected with and operating the rudder; of a plurality of solenoids controlling said engine, and a circuit changer in the bow of the vessel, said circuit changer consisting of segments divided into as many groups as there are solenoids; each group having an uneven number of segments, more than one; the segments of each group connected together by resistances, but insulated from the segments of the other groups; a circuit, extending from the central segment of each group to a particular solenoid; a contact arm in electrical contact with said segments; and a return circuit or circuits from said solenoids to said contact arm substantially as described.

Canadian Notes.

Special Correspondence to the MARINE REVIEW.

KINGSTON, Ont., March 1.—Mr. Julien Chabat, who has managed the affairs of the Richelieu and Ontario Navigation Company for a number of years, has been retired. There are several applicants for the place and the probabilities are Mr. C. F. Gildersleeve of Kingston will be successful. The company proposes to open an office in Buffalo, as the steamer *Columbian* is to be placed on the route from Buffalo to Chippewa. The appointments of the directors are also causing surprise. New blood has been introduced and some of the veteran captains like Ada, McGrath and Sinclair have been retired.

The city council of Kingston has granted exemption from taxation—save school rates—for ten years to the Montreal Transportation Company. This is the second time exemption has been granted. A special act of parliament will have to be secured to enforce the city ordinance. Through this company large expenditures of money are made, the citizens reaping a share of the benefit. A statement drawn up shows that the concern expends \$325,000 annually, and \$100,000 additional is expended by steamers doing business at the company's wharves. Just now about 300 men are engaged building new barges and repairing old ones owned by the company. It is expected that a conclusion regarding the elevator question will certainly be reached this year. The Montreal Transportation Company with other capitalists will put it up.

Capt. Scott, who was in the propeller *Persia* during the past sixteen years, will command next season the steamer *Campana* trading between Chicago and Kingston. Other officers are: Propeller Lake Michigan, Capt. Robert Chestnut; Acadia, Capt. John Clifford; Arabia, Capt. O. Patenande; Melbourne, Capt. J. Chestnut; Ocean, Capt. Malcolmson.

Forwarders of Montreal have protested against any reduction in the Lachine canal force.

Publications.

Secretary W. L. Capps of the Society of Naval Architects and marine engineers has informed the members that, on account of the unfortunate fire which destroyed the printing establishment where the work of publishing the transactions of the society for 1893 was in progress, it is not probable that the volume will be ready for issue to members before the end of the present month.

Of all the costly advertising matter sent out by the Canadian Pacific Railway, the map entitled *Around the World* by the Canadian Pacific Route is undoubtedly the most unique and attractive. In a globe, on which the northern hemisphere is represented, the route of the Canadian Pacific around the earth is well outlined.

Seaton & Rounthwaite's pocket Book of Marine Engineering Rules and Tables, is handsomely bound in red morocco and printed on thin paper. It contains much information and many tables found in no other work. This is especially true of the valve gear diagrams. No drawing room in any lake ship yard or marine engine building shop should be without a copy. It costs \$3 and is published by D. Van Nostrand Company, No. 23 Murray street, New York, N. Y.

From Longmans, Green & Co., No. 15 East Sixteenth street, New York, we have received a copy of *Marine Boiler Management and Construction* by C. E. Stromeyer, engineer surveyor to Lloyd's Register and a prominent member of the leading technical societies associated with the ship building industry of Great Britain. The book treats of boiler troubles and repairs, corrosion, fuels and heat on the properties of iron and steel, on boiler mechanics, workshop practices and boiler designs. As the book has just been issued, it is up to date in all respects.

The Roberts Safety Water Tube Boiler Company of Red Bank, N. J., and 18 Cortlandt street, New York, are building a boiler 9 feet square and with 56 square feet of grate surface for the quarantine steamer *State* of New York.

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U. S. ENGINEER OFFICE, 34 WEST CON-
gress Street, Detroit, Mich., February 9,
1894. Sealed proposals for (A) Excavation with-
in Coffey Dam; (B) Building Cribs within Coffey
Dam; and (C) Miter Sill Valves; for the 800-ft.
Lock, St. Mary's Falls Canal, will be received at
this office until 2 P.M., March 12, 1894, and then
publicly opened. Specifications, blank forms,
and all available information will be furnished
on application. O. M. POE, Col., Corps of
Engineers, etc. 3-1

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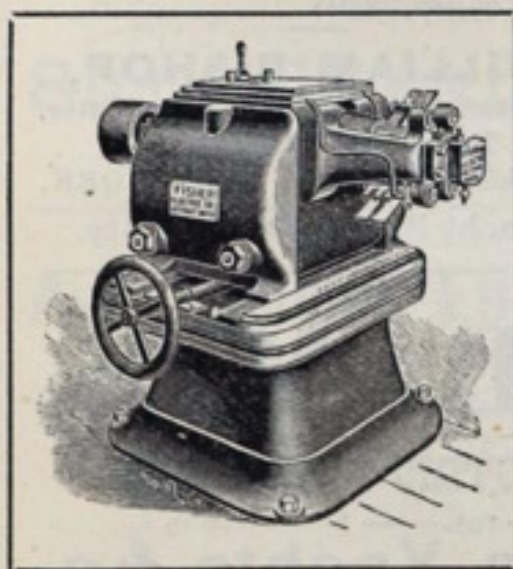
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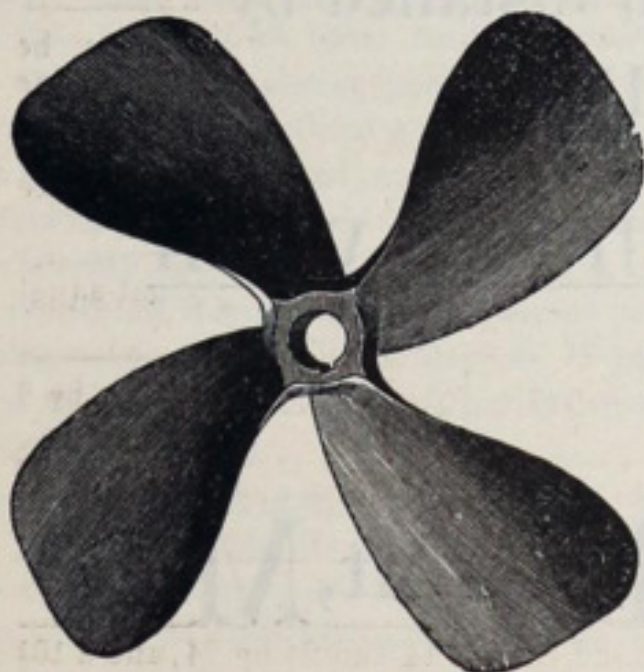
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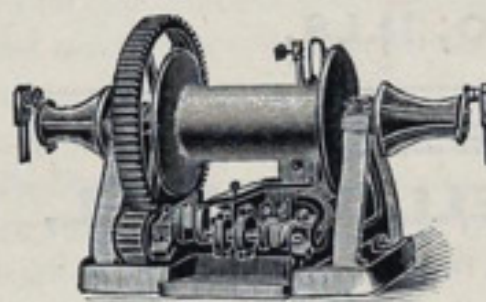
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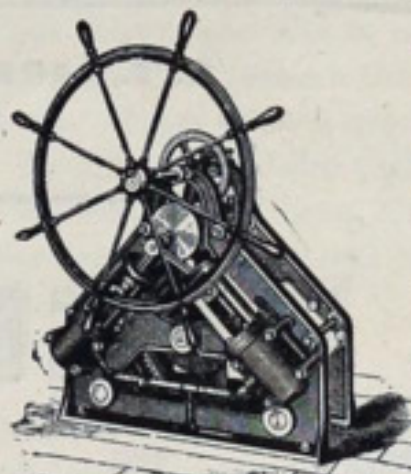
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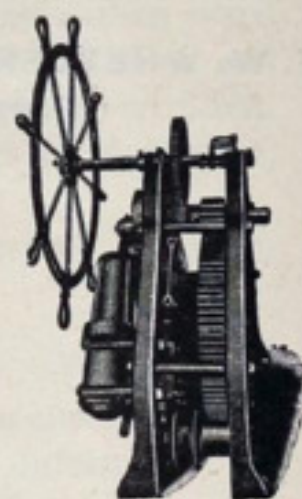
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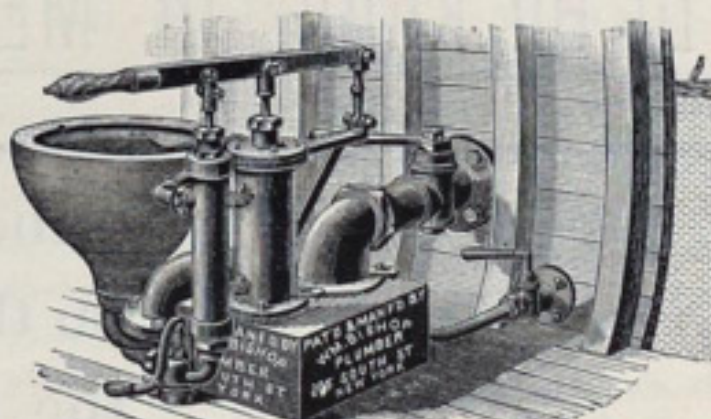
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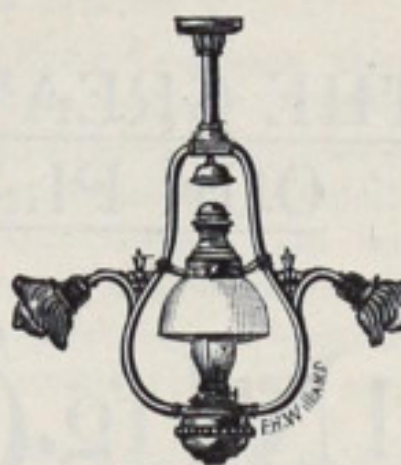
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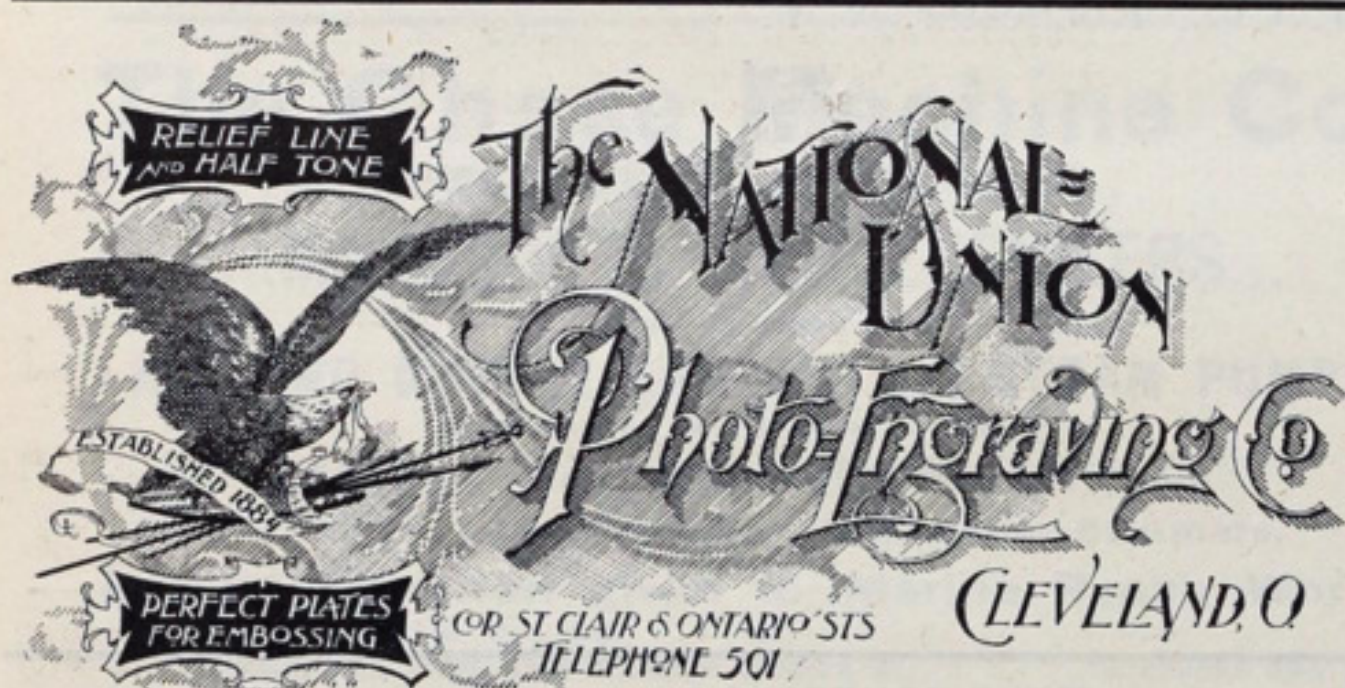
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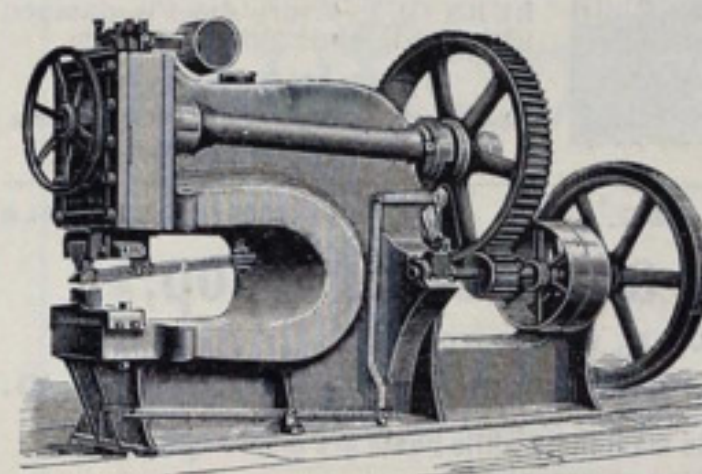
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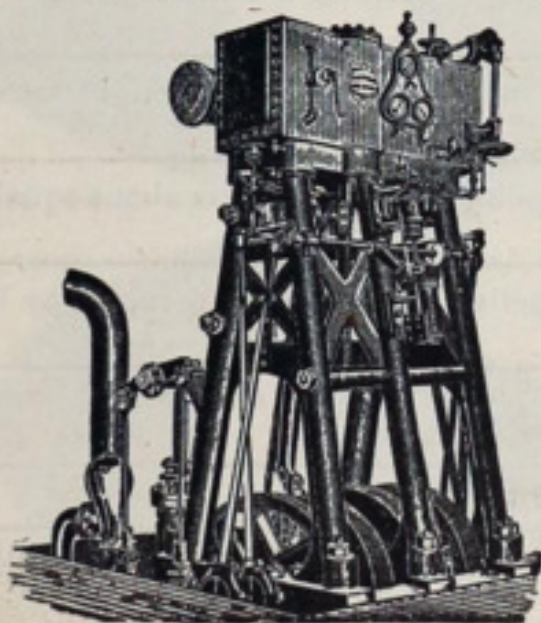
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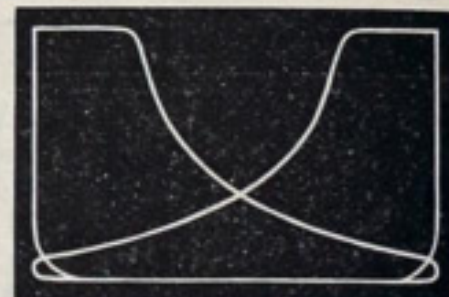
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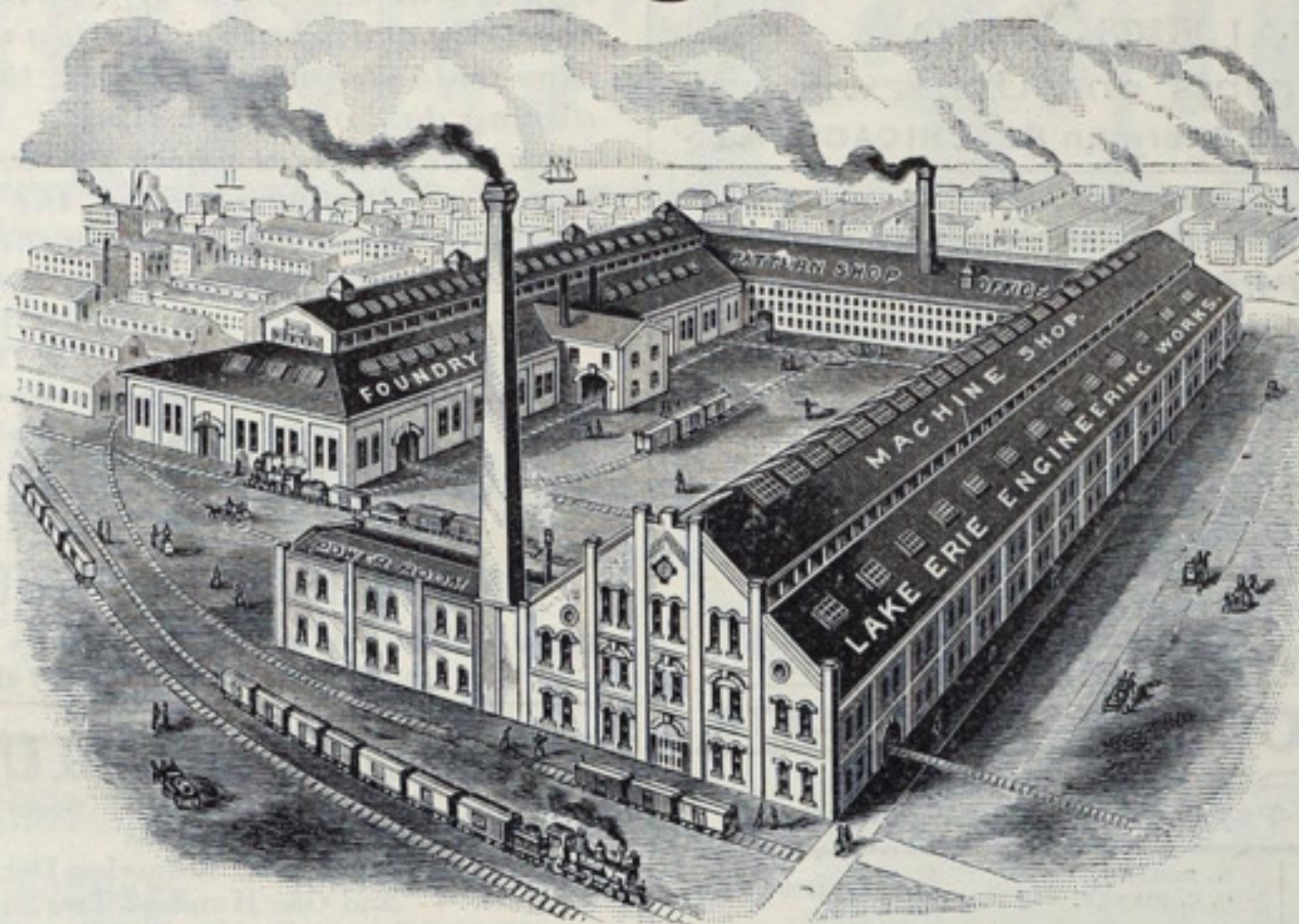
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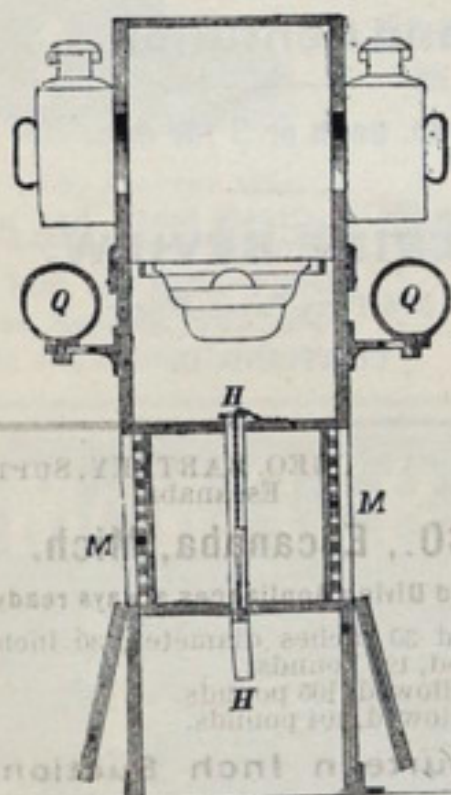
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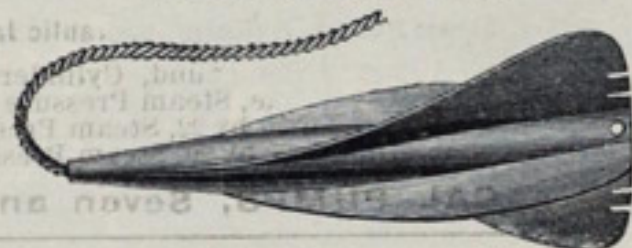
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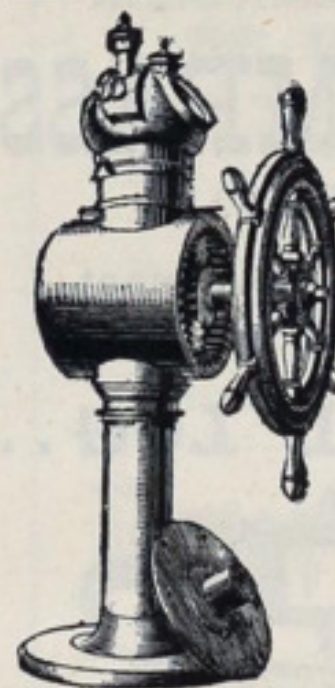
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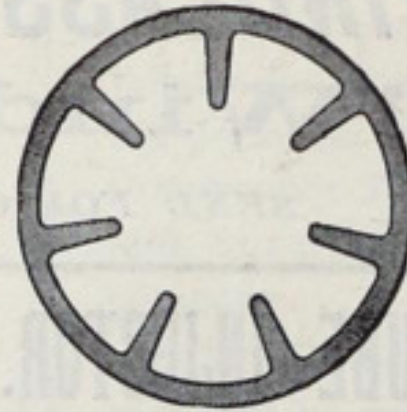
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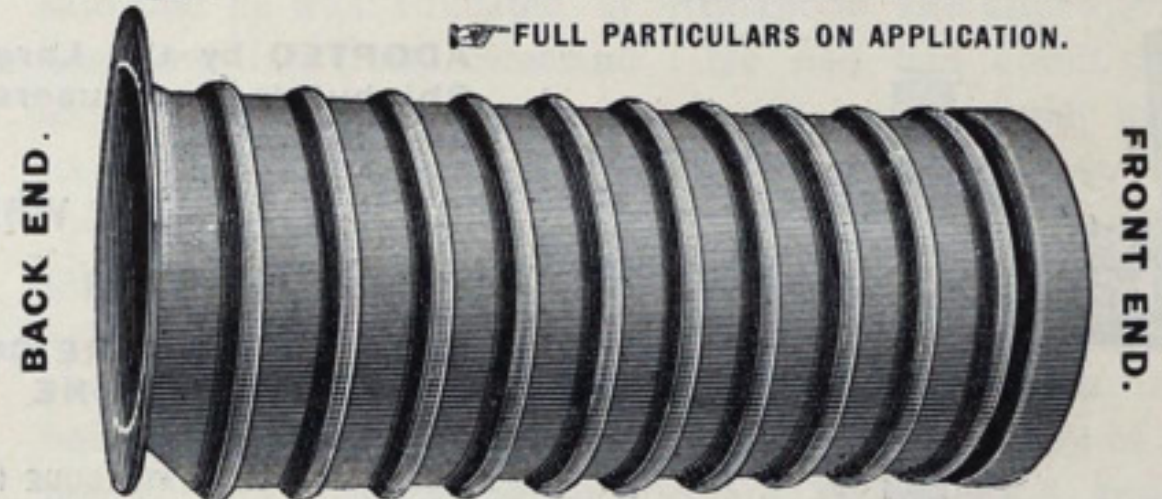
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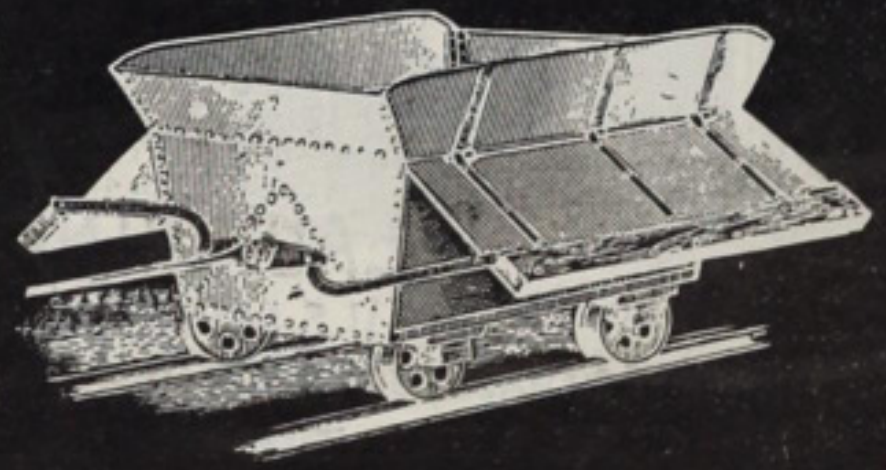
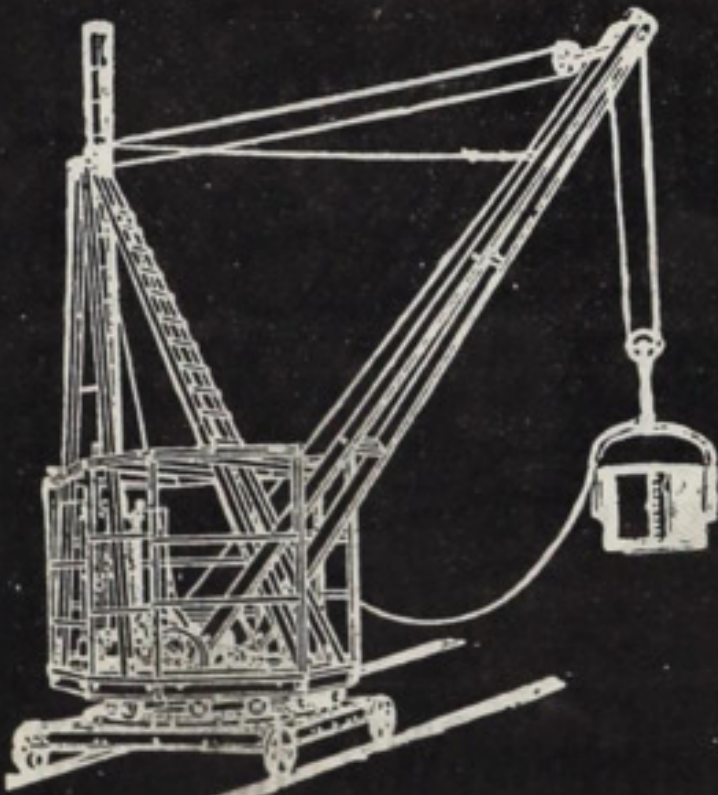
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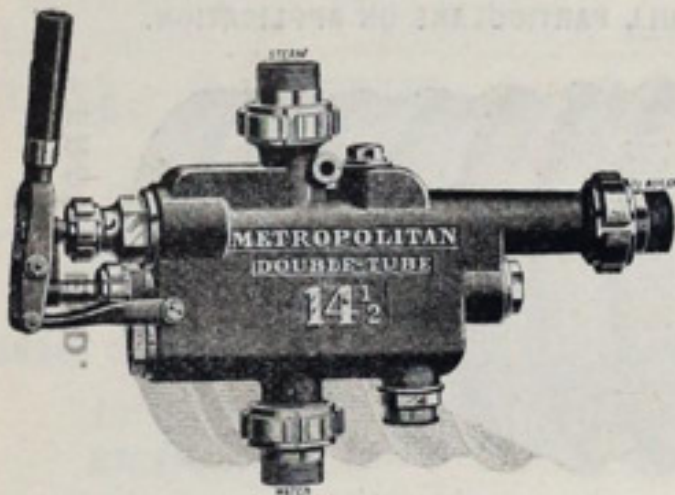
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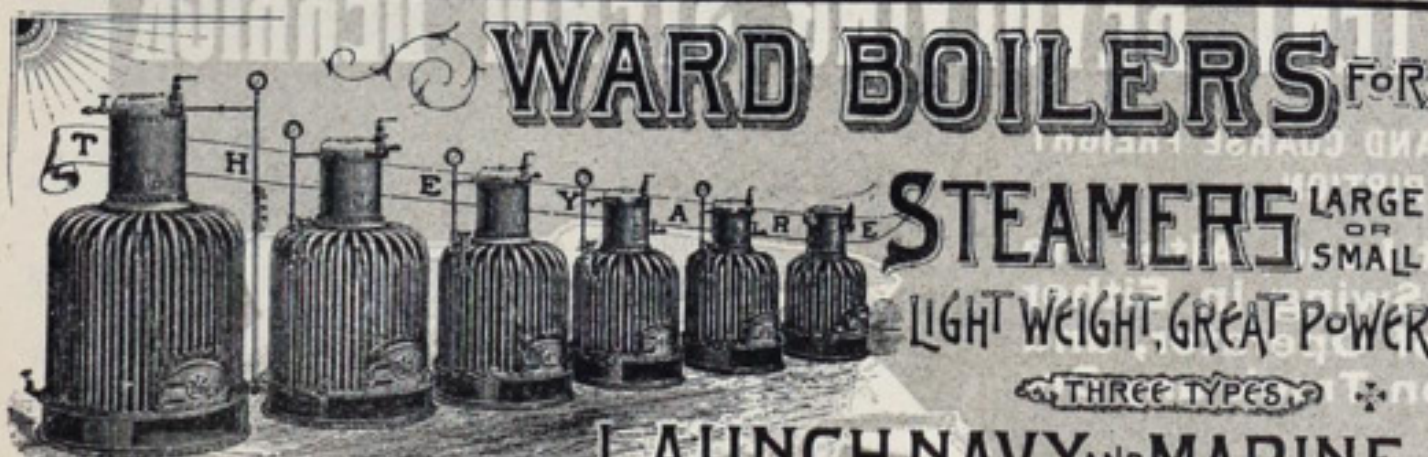
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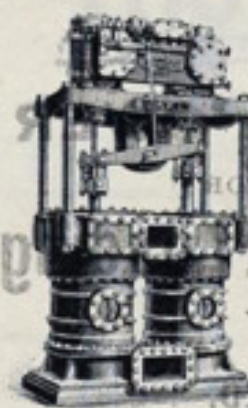
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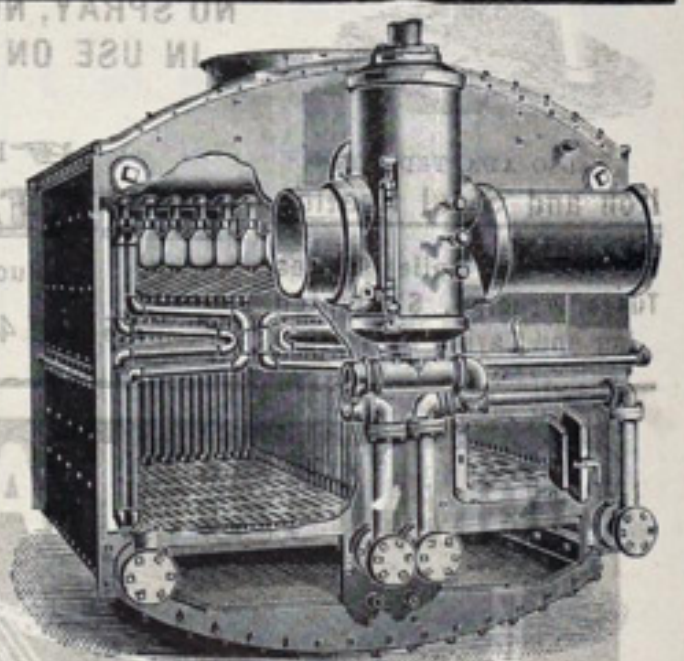
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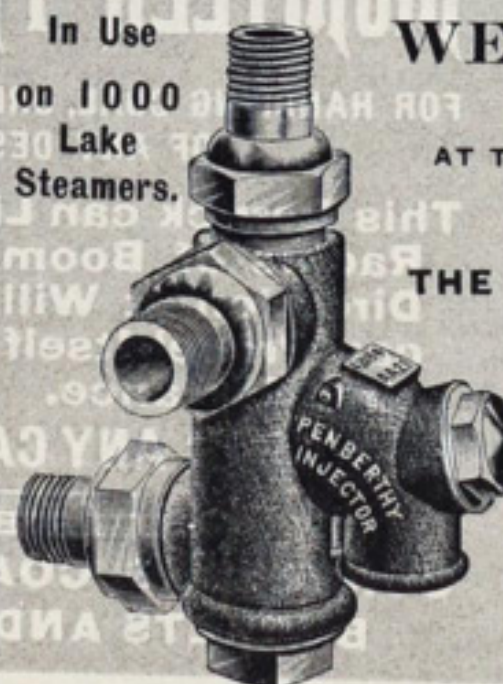
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